Indications for and Most Satisfactory Methods of Bringing about Premature Labor and Accouchement Forcé

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One of the peculiarities of the obstetric literature for the year 1902 was its marked wealth in articles dealing with the indications for the induction of premature labor, and the most satisfactory methods of terminating pregnancy when complicated by eclampsia or hemorrhage.

This may be attributed to two factors: Firstly, that at the International Gynecological and Obstetrical Congress, held in Rome, September, 1902, one of the chief themes for discussion was the medical indications for the induction of labor, in which Pinard, Hofmeier, Rein, Schauta and Simpson participated; and secondly, the endorsement by Leopold of the use of Bossi's instrument for dilating the cervix in accouchement forcé. In view of these facts, I have thought that it might be interesting to lay before you my own experience along these lines.

As you are doubtless aware, rapid manual dilatation of the cervix, followed by version and extraction in cases of placenta prævia and eclampsia, was first introduced by Jacques Guillemeau and Louise Bourgeoise in the early part of the seventeenth century, and soon became a routine procedure. It is likewise interesting to remember that the former, who was a pupil of Ambroise Paré, had been able by its means to save his master's daughter from perishing from hemorrhage following placenta prævia; and that Mauriceau attributed the death of his sister from the same condition to the fact that no one could be found in Paris willing to undertake the necessary operation.

Prior to the middle of the eighteenth century, accouchement forcé was performed very crudely, being brought about by the forcible introduction of the hand through the cervix, which no doubt often led

directly to the death of the patient from hemorrhage or infection. In 1747, however, Puzos advocated the employment of less radical measures, and recommended that the cervix be only gradually dilated in order to permit the contractility of the uterus to come into play, and thus aid in the process of dilatation.

The induction of premature labor in moderate degrees of pelvic contraction was first advocated in England, and we learn from Denman that the first operation was performed by Dr. Macaulay shortly before 1756, in which year some of the most eminent medical men of London came together for the purpose of discussing the most available means of doing away with the horrible mortality incident to Cesarean section, and of considering the moral rectitude of, and the advantages which might be expected from, the induction of premature labor. Since that time the operation has been a recognized procedure in England and Germany; but owing to the opposition of Baudelocque did not become popularized in France until 1831, when it was taken up by Stolz, although as early as 1778 its merits had been urged by Roussel de Vauzelme.

Gradually the indications for the induction of premature labor became more extended, so that at the present time it is recognized as a perfectly justifiable procedure whenever the life of the mother is seriously threatened by any condition which offers a reasonable prospect of improvement upon the termination of pregnancy. Moreover, in a much smaller class of cases it may be undertaken in the interests of the child alone, provided, of course, that it does not materially increase the danger to the mother. Thus, in addition to its employment in moderate degrees of pelvic contraction, the operation is a recognized procedure in threatened eclampsia; in certain cases of toxemia of pregnancy, albuminuria and uncompensated cardiac lesions; less frequently in severe cases of neuritis, chorea, diabetes, pernicious anemia and pyelonephritis, as well as in certain diseases of the ovum, such as hydatidiform mole and pronounced degrees of hydramnios. It is likewise indicated in most cases of complete or partial placenta prævia as soon as a positive diagnosis is made; and occasionally in the rare cases of habitual death of the fetus. On the other hand, it is not to be recommended in the acute infectious diseases, nor in tuberculosis except when the condition of the mother is such that it does not seem probable that she will survive until the end of pregnancy.

I shall not attempt to enter into the discussion of these and various other indications, as they have recently been considered in great detail

and in a masterly manner by Schauta and Pinard; but shall, in the first part of my paper, limit myself to the discussion of the justifiability of the operation in (1) contracted pelves, (2) toxemia of pregnancy, and (3) placenta prævia.

(1) *Contracted Pelves.* Many authorities recommend the induction of premature labor in moderate degrees of pelvic contraction, in the hope that a child, whose birth would be impossible at term, may safely be delivered at an earlier period when its head is somewhat smaller and considerably more malleable. Of course the earlier the operation is undertaken the easier the labor will be, but at the same time it must be remembered that the child's chances of living afterwards decrease in almost geometrical proportion with every week subtracted from the normal duration of pregnancy. Accordingly, if the operation is to be undertaken at all, it should be postponed as late as possible, preferably until the thirty-fourth or thirty-sixth week, in order to afford an opportunity for the greatest possible development consistent with safe delivery.

The advocates of the operation claim that it is indicated in generally contracted pelves having a conjugata vera of 7.5 to 9 cm., and in flat pelves in which the same measurement varies from 7 to 9 cm.; and a very considerable clinical experience has abundantly demonstrated that the risks connected with it are almost nil so far as the mother is concerned, Ahlfeld, Bar, Leopold and Pinard having reported a mortality of only 1.3 per cent in 391 operations. At the same time it should be remembered that the operation is advocated solely in the interests of the child, since equally good maternal results may be obtained after delivery at term by various procedures. Accordingly, in order to justify its performance, it becomes necessary to demonstrate that it will result in saving a greater number of children than any other procedure.

A survey of the literature shows that the primary fetal mortality is not always the same, the results of different operators varying from 12 to 45 per cent. Kleinwächter, in the last edition of his monograph upon the interruption of pregnancy, placed it at 21.7 per cent, which, however, became increased to 39.6 per cent before the children were discharged from the hospital. Moreover, this does not represent the ultimate result of the operation, as it must be borne in mind that premature children require an amount of care and skillful nursing which is rarely available in the homes of the poor; and that, therefore, one can obtain an accurate idea of the value of the operation only by esti-

mating the number of children who survive the first year; and I do not think one will go far wrong in calculating that not more than one-third survive that period.

This appears to me to be a very poor showing, and if the operation is to be undertaken solely in the interests of the child, it would seem that the results obtained differ only in degree from those following the induction of abortion at an early period of pregnancy. Moreover, it would appear probable that in many instances the operation is performed unnecessarily, since experience teaches that about 70 per cent of all labors occurring in pelves belonging within this category end spontaneously. Accordingly, admitting, for the sake of argument, what is by no means the case, that the remaining 30 per cent would result in dead born children, one would have a fetal mortality hardly exceeding that which is admitted by the advocates of the induction of premature labor. But even if all the operative cases ended fatally, the failure to induce premature labor would appear justifiable, as the 70 per cent of children which were delivered spontaneously, would be fully developed, and thus be far better able to cope with the dangers of the first year of life than a similar number of premature children.

Acting upon this belief, I have never thought it necessary in my work to resort to the induction of premature labor in contracted pelves, but have allowed my patients to go to term and fall into labor spontaneously, conducting the case under the most rigid aseptic precautions, and making vaginal examinations only when urgently indicated. The patient is allowed to enter the second stage, and if at the end of two hours, in spite of good pains, the head shows no signs of engaging, and the mother and child are both in good condition and under suitable surroundings, Cesarean section is at once resorted to. This, however, is rarely necessary, as in the vast majority of cases, before the expiration of this period, the head shows signs of molding and adapts itself to the pelvic inlet, so that delivery occurs spontaneously after a longer or shorter period, or, at the most, can be effected by a high or mid forceps operation.

My sentiments in this regard are confirmed by the recent expressions of Bar and Pinard, the former preferring Cesarean section and the latter symphyseotomy in the class of cases under discussion. At the same time it must be admitted that Keitler and Pernitza, in a recent article from Chrobak's clinic, take an opposite view, and believe that the induction of premature labor has still a very considerable field of application. Personally, I consider that the only indication for its per-

formance in cases of disproportion between the head and the pelvis is to be found in the rare cases of prolonged pregnancy in which labor does not come on at the expected time, or in the exceptional instances in which the previous history of the patient and a most careful physical examination lead us to suspect the existence of an unusually large child.

(2) *Toxemia of Pregnancy.* By this term we understand a morbid condition resulting from abnormalities in metabolism incident to the pregnant state. The symptoms accompanying it vary greatly; in some cases the patient suffers merely from an occasional headache or a slight increase in nausea, in others from edema of extremities and face, associated with albuminuria and the presence of casts; while in still more marked cases symptoms indicative of eclampsia may appear.

Whenever a patient presents any of these symptoms, but particularly when the routine examination of the urine reveals the presence of albumin, even though symptoms are absent, the total amount of urine passed in the twenty-four hours should be collected and subjected to the most careful examination, the amounts of urea and albumin being determined. In private practice, this can be roughly approximated by means of Doremus' ureometer and Esbach's albuminometer, though in hospital practice the total amount of nitrogen and its various subdivisions should be determined. Whenever one finds that the urea output is much lower than it should be, even though albumin be absent, but especially when it is present, the patient should be put to bed, placed upon a rigid milk diet and subjected to a rigorous eliminative treatment—purges, hot packs, etc. In the vast majority of cases prompt improvement follows and the condition passes off, at least temporarily. But in a small number of cases the symptoms become more severe in spite of the treatment, and the amount of urea steadily falls, while that of the albumin increases. Under such circumstances interference is urgently demanded, since if it is neglected eclampsia may supervene; while in rare instances convulsions do not occur, but the patient passes into a comatose condition from which she never rallies. In this class of cases the operation is performed solely in the interests of the mother, as the life of the premature child is frequently so seriously compromised that its chances deserve but little consideration.

(3) *Placenta Prævia.* Owing to the serious danger of sudden and occasionally fatal hemorrhage, as long as complete or partial placenta prævia exists, I consider that pregnancy should be terminated as soon as possible after a positive diagnosis is made. The best methods of

bringing this about, however, will be discussed in the second half of the article, in which accouchement forcé is considered.

Methods of Inducing Labor. Of the various methods which have from time to time been suggested for the induction of premature labor, I believe that only two are universally available; namely, the introduction of a sterile bougie into the uterus (Krause's method), or the employment of Champetier de Ribes' balloon. Krause's method is by all odds the simplest at our command, and in the vast majority of cases is attended by very satisfactory results. Indeed, its only disadvantage lies in its comparative uncertainty and the fact that several days may elapse before pains make their appearance, so that it may occasionally become necessary to follow the introduction of the first bougie by a second, and that by a third; while in very exceptional cases the uterus may be so refractory to irritation that some other means of stimulating it to contraction must be employed. But generally speaking, whenever there is no immediate haste, and especially in the cases in which we wish to subject the patient to as little manipulation as possible, Krause's method is the most satisfactory one at our disposal, and its employment cannot be too earnestly recommended.

On the other hand, if it is desired to bring about labor more rapidly, Champetier de Ribes' balloon offers a most effectual means of so doing. Naturally, its employment presupposes a slight degree of dilatation of the cervical canal, such as is usually present in the later months of pregnancy in most multiparous women; but in most primiparæ, and exceptionally in multiparæ, it may be necessary to dilate the cervical canal by means of a Goodell or some other dilator, sufficiently to permit the introduction of the bag. Where haste is essential, dilatation may be accelerated by attaching a weight to the end of the bag and allowing it to hang over the foot of the bed, and when this is not practicable a similar effect may be obtained by pinning the end of the tube to the mattress. On the other hand, if the condition of the patient be very serious when first seen, particularly if she be suffering from a profound toxemia and appears likely to go into convulsions at any moment, as manifested by intense headache, epigastric pain and disturbances of vision, more radical methods must be resorted to, as the object of the interference is to do away with the possible onset of eclampsia.

This brings us to the consideration of *accouchement forcé* and the best methods of effecting it. In the hands of the early obstetricians, as the result of crude methods and an absolute lack of aseptic tech-

nique, the operation was attended by so great a maternal mortality that it gradually fell into deserved disrepute. But, with the perfection of aseptic technique and the adoption of more conservative means of bringing about the dilatation of the cervix, the results following it have markedly improved, so that, at the present time, many hundreds of women owe their lives to its employment.

The main indications for its performance are: (a) Eclampsia; (b) profound toxemia; (c) accidental hemorrhage resulting from premature separation of the placenta; (d) placenta prævia and (e) cases which have fallen into labor spontaneously, but in which symptoms indicative of danger to the mother or child supervene before the cervix has become fully dilated. In the latter group of cases, the most important indication on the part of the mother is afforded by profound exhaustion, as manifested by a marked increase in the frequency of the pulse or the occurrence of fever; and on the part of the fetus by pronounced variations in the fetal pulse rate, which becomes either too rapid or too slow, the passage of meconium in head presentations, as well as certain cases of prolapse of the cord. Generally speaking, every one must admit that the operation will be justifiable under any of the conditions just mentioned, provided it can be accomplished without seriously endangering the life of the mother; but, on the other hand, if it exposes her to any considerable danger, it should be undertaken only under the most pressing indications.

That the operation is imperatively demanded in eclampsia is demonstrated both by theoretical considerations and practical experience. All of the more recent investigations concerning the nature of the disease tend to indicate that it is due indirectly to abnormalities of metabolism, as the result of which certain as yet unknown metabolic poisons are retained within the body and circulate in the blood, thus giving rise to the various lesions of the disease. Whether this poison is derived from the maternal or fetal metabolism is a question which has not been decided, although much of the more recent work upon the subject would seem to point to the fetus as its source. Additional probability is lent to this view by the well known fact that in the rare cases in which the disease does not lead to the termination of pregnancy, it ceases spontaneously shortly after the death of the child, as well as by the finding of lesions in the fetus identical with those observed in the maternal organs.

At the same time, the most potent argument in favor of interference is afforded by the clinical history of cases which have been so treated,

since the observations of Dührssen, Olshausen and Zweifel show that the convulsive attacks ceased almost immediately after delivery—in 93.75, 85 and 66 per cent of their cases, respectively. Moreover, the careful examination of the urine before and shortly after the attack clearly indicates that the mere act of delivery exerts a favorable influence upon the metabolism; since the urine, which at the time of the attack, is extremely scanty in amount, very deficient in urea and contains immense quantities of albumin and casts, in the vast majority of cases becomes greatly increased in quantity immediately after delivery, while the amount of albumin undergoes a very prompt diminution, and that of the urea rapidly increases. At the same time, it would appear that the latter change occurs more gradually than the former, thus indicating that certain reparatory processes must occur before the kidneys are capable of resuming the secretion of anything like a normal urine. In many cases the urea output reaches normal within twenty-four hours after delivery, and may attain an unusually high level in the following few days, thus indicating that, during the later weeks of pregnancy, there has been a heaping of certain nitrogenous materials in the body which, under normal conditions, should have escaped with the urine.

Exactly the same line of argument applies to the cases of deep toxemia, which differ from eclampsia merely in degree, especially since in several instances, which ended fatally without the appearance of convulsions, autopsy has shown the presence of lesions identical with those observed in eclampsia.

No one disputes the justifiability of the operation in the cases of accidental hemorrhage following premature separation of the normally implanted placenta, and the same may be said of the cases of placenta prævia, in which the hemorrhage is sufficiently serious to endanger the life of the patient. Under such circumstances the loss of blood cannot be controlled until the uterus is emptied and is able to contract and retract satisfactorily, thus compressing the bleeding vessels. And the sooner this can be accomplished the better, provided, of course, that the means employed for the purpose do not defeat the very object for which the operation was undertaken.

In the last group of cases—those in which an apparently healthy woman has fallen into labor spontaneously, but in whom the cervix has become only partially dilated—the necessity for prompt delivery is open to considerable discussion, and becomes imperative only in those cases in which a continuance of the condition really threatens

life. Accordingly, the operation should not be undertaken in the interests of the child unless it can be accomplished without subjecting the mother to serious danger. On the other hand, if it can be proven that rapid dilatation of the cervix can be readily effected without great danger, the propriety of interference for the sake of the fetus is clearly indicated.

Before considering my own experience with the operation, I shall mention briefly the most available methods by which accouchement forcé can be accomplished. Chronologically considered the following have been employed:

1. Dilatation of the cervix by means of the hand shaped as a cone;
2. Mechanical devices, as invented by Osiander, Busch and others;
3. The employment of Champetier de Ribes' balloon;
4. The employment of deep cervical incisions, as recommended by Dührssen;
5. The employment of Bossi's dilator;
6. The employment of Harris' method of manual dilatation;
7. The employment of bimanual methods of dilatation, as recommended by Edgar and Bonnaire.

As far as my experience goes, I think we are justified in concluding that the use of the hand as a cone, the early metallic dilators, the Dührssen incisions and the various bimanual maneuvers are far inferior to the other methods mentioned; so that practically those which are at our disposal are the employment of Champetier de Ribes' balloon, Bossi's dilator and Harris' manual method.

It is unnecessary in this place to give a detailed description of Champetier de Ribes' balloon and its method of employment. Suffice it is to say that where immediate delivery is not urgently indicated, dilatation of the cervix can be accomplished more satisfactorily by its means than by any other. In such cases the bag not only dilates the cervix more or less after the manner of the amniotic sac, but at the same time incites the uterus to vigorous contraction, and thus materially aids in the process.

On the other hand, when immediate delivery is imperative, some other method should be employed. During the past few years a great deal has been written concerning the advantages of Bossi's metallic dilator. This instrument, which was invented in 1892, consists of four or eight blades, so arranged as to act as powerful compound levers, in which the force is supplied by a screw or vice at the extremity of the handles. Its employment was practically limited to Bossi's clinic until

Leopold became familiar with it in 1901 and tested it upon his own material. In 1902 he reported two series of cases, aggregating 17 in all, in which he had employed it, 12 of the patients suffering from eclampsia, and concluded that it was a most valuable instrument, as by its means the cervix could be readily dilated within twenty or thirty minutes without subjecting the patient to any serious injury. In three of his cases tears of the cervix occurred, which required immediate repair, but he did not consider this a serious objection, as he believed that such accidents would occur less frequently with greater experience.

Leopold's publications aroused the greatest interest in Germany, so that between his publication of May 10, 1902, and the end of the year, nine other articles appeared upon the subject in the Centralblatt f. Gynäkologie; namely, those of Rissman, Knapp, Kaiser, Knapp, Wagner, Bischoff, Langhoff, Müller and Frommel. Bossi, in a recent number of *L'Obstétrique,* records his exeprience with the instrument, and states that it is most efficient, and considers that it affords the most rapid method of dilating the cervix known to science. He records one case in which the cervical canal was obliterated and the external os 3 cm. in diameter, in which complete dilatation was secured in seven minutes, and states that by no other means could so successful a result be obtained in so short a time.

Notwithstanding Leopold's recommendation of the instrument, I am inclined to regard its general employment with disfavor, as I believe that a large part of his enthusiam is due to the fact that up to very recently he was unacquainted with the value of accouchement forcé, as evidenced by the fact that the vast majority of the specimens in his beautiful atlas, "Uterus und Kind," were obtained from eclamptic women who died undelivered.

Harris' method of dilatation becomes available whenever the cervical canal is sufficiently patulous to admit one finger, but if the canal be intact this degree of dilatation must be secured by means of metallic dilators. As soon as one finger can be passed through the internal os, the thumb is gradually forced up alongside of it and moved over it with very much the same motion as in snapping one's fingers; then two fingers and the thumb, three fingers and the thumb, and finally four fingers and the thumb are introduced, the back of the thumb being used as the dilating force throughout each maneuver. By this means I have been able, with one exception, to dilate the cervix in every case in which I have made the attempt in the last few months of pregnancy.

In many instances complete dilatation can be accomplished with great rapidity, as in not a few of my own cases in which the resistance was offered merely by the external os, only three to five minutes were required; while the most resistant cervix can usually be completely dilated within half an hour. I mention the rapidity of the method, not so much as an advantage, but merely to show that by its means dilatation can be effected quite as readily and even more rapidly than by Bossi's method. At the same time, I consider too rapid operating extremely reprehensible, and am convinced that in several cases I have done my patients great harm by indulging in it. Other things being equal, the more slowly it is effected the better.

My experience with accouchement forcé is based upon 87 cases in which Harris' method was employed, namely, eclampsia, 30; toxemia of pregnancy, 13; placenta prævia, 10; hastening labor, 34; and it is my object, after considering the cases more or less critically, to draw certain conclusions as to the justifiability of accouchement forcé in general, and then determine which is the most available method to be employed in particular cases.

Before taking up these considerations, however, I think it would be well to agree as to the significanace of certain terms employed in describing the condition of the cervix at the beginning of the operation. Thus, in one group of cases, we speak of the cervix as being intact, when neither the external nor internal os is dilated, and the two are separated by a canal 3 or 4 cm. in length. In a second group, the cervical canal is obliterated and the external os intact; under such circumstances the internal os has disappeared and the cavity of the canal has become continuous with that of the body of the uterus, so that the only resistance offered is that of the os externum; while in a third group a still more advanced condition is observed, the only obstacle to the passage of the child being the portion of external os remaining undilated.

I shall now take up the consideration of each group of cases:

(a) *Eclampsia.* Accouchement forcé was resorted to in 30 cases of this disease. Of these the cervical canal was intact in 17; the canal obliterated but the external os intact in 5; while the external os was partially dilated in 8 cases. Seven women and 12 children died—a mortality of 23 and 40 per cent, respectively. Six of the women did not regain consciousness and died within twenty-four hours after delivery; so that I consider that their deaths were due to the underlying disease and not to the method of delivery. The seventh death,

however, should be attributed to the operation itself. In this case, a 17-year-old colored primipara, was admitted to the hospital after having had a number of convulsions. Examination showed that the external os was undilated, the cervical canal 3.5 cm. long, and the entire cervix almost cartilaginous in consistency. In spite of this condition, however, it was thought advisable to resort to accouchement forcé by Harris' method. On attempting to dilate the cervix sufficiently to permit the introduction of one finger, it was found that it could not be effected with the most powerful Goodell instrument, so that Hegar's graduated cylindrical dilators were employed. After an hour's steady effort the cervical canal had become only sufficiently patulous to admit the little finger, and I felt sure that further attempts at immediate forcible dilatation could only result in a deep cervical tear. Accordingly, a medium-sized Champetier de Ribes' balloon was introduced into the uterus and soon gave rise to contractions, which, however, at the end of sixteen hours had failed to bring about any further dilatation, although the tissues had become softer and more succulent. The bag was then removed and complete dilatation effected by Harris' method without great difficulty, after which the patient was delivered of a dead child by version and extraction. There was a tolerably deep tear on the left side of the cervix, and the patient gradually developed a fatal infection, due no doubt to the prolonged manipulations to which she had been subjected, and I feel sure that she was sacrificed to an ill-judged zeal.

Looking backward, I consider that it would have been far more conservative, in this case, to have resorted to Cesarean section as soon as the condition of the cervix was recognized. At the same time, I do not desire to be understood as advocating its frequent performance; as this is the only case of eclampsia I have seen in which I considered the operation justifiable, believing that the vast majority of cases can be delivered almost as promptly and far more conservatively by accouchement forcé. But at the same time it must be admitted that very exceptionally in primiparous women, in whom the cervix is intact and almost cartilaginous in consistency, there exists a distinct but very limited field for Cesarean section. According to Olshausen, such an indication may be encountered about once in every 100 or 125 cases of eclampsia.

At first glance the fetal mortality of 40 per cent appears excessively high, but when we take into consideration the fact that the children were premature in nearly one-half of the cases, and in several instances

were already dead at the beginning of the operation, the showing is not bad, and, indeed, may be considered very satisfactory.

Summing up my results, it would appear that in the 30 cases of eclampsia which were delivered by accouchement forcé, one woman perished as the result of infection, the direct result of the interference. At the same time it should be inquired whether this was the only disadvantage connected with the operation, and, unfortunately, a negative answer must be given. For, on looking over my histories, I find that cervical tears were recorded in two-thirds of the cases, 14 being described as deep and 6 as slight. Of the former, three were so extensive as to involve vessels of considerable size, giving rise to profuse hemorrhage which necessitated immediate repair; while in the other 17 there were no immediate symptoms, the lesion being recognized only at the examination prior to discharge.

My conclusions as to the employment of accouchement forcé in eclampsia may be summarized as follows: If the cervix will admit one finger or can be readily dilated sufficiently to do so, accouchement forcé by Harris' method is a safe and justifiable procedure, provided it be effected slowly. On the other hand, if the cervix is cartilaginous in consistency, and appears to offer a practically insuperable obstacle to dilatation, it would appear more conservative in hospital practice to resort to Cesarean section; while in private practice better results will be obtained by relying upon palliative treatment rather than by attempting immediate delivery.

(b) *Toxemia of Pregnancy.* I have resorted to accouchement forcé in 13 cases of profound toxemia after medical treatment had shown itself unavailing. In 11 cases the cervical canal was intact and in two the canal was obliterated and the external os partially dilated. In this series three mothers and ten children died, a mortality of 23 and 77 per cent, respectively. Moreover there were 4 deep and 3 slight tears, while in 6 cases the cervix was apparently uninjured. One of the women died in a comatose condition several days after the operation without the appearance of eclampsia; the second died from eclampsia five hours after the completion of the operation, while the third died from an incomplete rupture of the uterus, with the formation of a large subperitoneal hematoma.

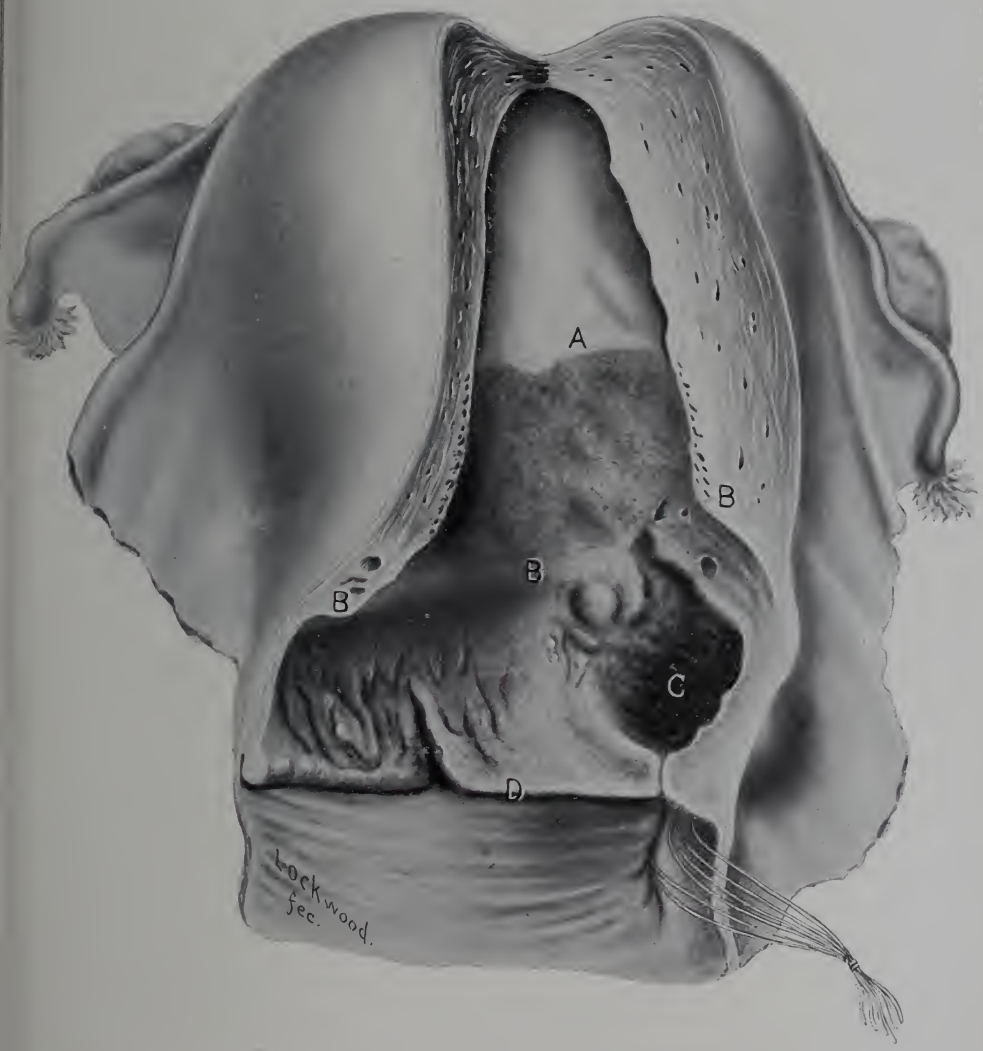
The last case was of very considerable interest, and calls for a detailed report. The patient was a 34-year-old V para, who had been treated at home for an acute toxemia by her physician, and was gradually growing worse. On entering the hospital she was found to be

six months pregnant and presented such grave symptoms that prompt delivery was determined upon. The cervical canal was intact, while the external os readily admitted the tips of two fingers. Dilatation was accomplished with great ease in a comparatively short space of time, and particular attention was paid to not exerting more force than the cervix could safely stand. The child, which presented by the head, was turned and readily extracted, and was found to be suffering from general edema. As the placenta did not come away spontaneously and could not be expressed by Credé's method, it was removed manually with considerable difficulty. It was immensely dropsical and weighed 2000 grms., nearly twice as much as the child. As careful inspection showed that it was considerably torn, the hand was again introduced into the uterus in order to ascertain whether any remnants had been retained, and found it perfectly empty. On withdrawing the hand, however, a deep tear was found on the left side of the cervix, extending through the vaginal fornix and up into the base of the broad ligament. As there was no hemorrhage at the time, and as the wound did not extend into the peritoneal cavity, it was thought that satisfactory results could be obtained by packing it with iodoform gauze. This was done and the patient left the table in excellent condition. Several hours later her condition suddenly became worse, and before anything could be done she expired. No autopsy was permitted, but careful examination by the vagina revealed the presence of a large subperitoneal hematoma on the left side of the uterus.

The apparently high fetal mortality will be readily understood when it is stated that in only one of the 13 cases had pregnancy reached full term.

As the result of my experience, therefore, I would conclude that in the class of cases under consideration pregnancy should, if possible, be terminated by the employment of the bougie or Champetier de Ribes' bag, accouchement forcé being reserved for the very exceptional cases in which danger of the onset of eclampsia appears so imminent that very rapid delivery is urgently indicated.

(c) *Placenta Prævia.* Ten women suffering from placenta prævia were delivered by accouchement forcé with 3 maternal and 8 fetal deaths—a mortality of 30 and 80 per cent, respectively. These results, however, are nothing like so bad as would appear at first sight, for the reason that two of the fatal cases would have died however treated, as they were brought into the hospital profoundly exsanguinated and died on the table, notwithstanding the fact that they were readily deliv-



RUPTURE OF UTERUS FOLLOWING ACCOUCHEMENT FORCÉ IN PLACENTA PRÆVIA.

A. Upper margin of placental attachment.
B. Contraction ring.
C. Rupture.
D. External os.

ered without further loss of blood. On the other hand, the third death should be attributed directly to the method of delivery. In this case, the patient, who entered the hospital in the seventh month of her sixth pregnancy, gave a history of repeated hemorrhage during the preceding five months, and was in a very anemic condition, although not losing blood at the time of admission. On examination the cervix presented an old stellate laceration; the external os readily admitted the tips of three fingers, while only one finger could be passed through the internal os, which was covered by placental tissue; and subsequent events showed that we had to deal with a complete placenta prævia. During the examination such profuse hemorrhage occurred that immediate assistance became imperative. It was my intention merely to dilate the internal os sufficiently to permit the introduction of two fingers for the performance of bipolar version, but as the cervix yielded so readily I was tempted to go on to complete dilatation by Harris' method, which was readily accomplished without apparent injury. The placenta was then perforated by the fingers, a foot seized and version readily effected, after which the child was slowly extracted. The placenta was easily expressed, and for a time there was no hemorrhage; but the appearance a few moments later of a slight but persistent bloody discharge led to a careful examination, which revealed a deep tear on the left side of the cervix, extending into the vaginal vault. This was readily exposed and repaired by a number of silkworm gut sutures, with the result of immediately checking the hemorrhage. The patient was put back to bed in fair condition, but an hour later began to bleed again, when a tight vaginal tampon was applied by an assistant, which, however, did not check the hemorrhage, and the patient died before I could reach the hospital.

At the autopsy it was found that the tear had extended not only through the vaginal portion of the cervix, but through the lower uterine segment as well, extending up to the contraction ring and giving rise to an incomplete rupture of the uterus, and the formation of a subperitoneal hematoma. It was likewise found that only the lower portion of the tear had been united by sutures, and that the fatal hemorrhage occurred from the upper portion which had escaped repair. Moreover, in three other cases which did not end fatally, deep tears of the cervix were observed which required immediate repair.

In view of these facts it would appear that in placenta prævia, owing to the unusual development of blood vessels in the cervix and lower

uterine segment, laceration occurs far more readily than in other cases, and accordingly accouchement forcé would appear to be contra-indicated except in a very small number of specially selected cases; and therefore should be undertaken only when the operator feels sure that he can lead the case to a successful termination. In all other cases it would seem that bipolar version and the use of the breech as a tampon is the most appropriate treatment, but at the same time it must be admitted that the child's chances are quite minimal when this method is employed. Accordingly, if the child is viable and in good condition, and the parents are particularly desirous of saving it, Champetier de Ribes' balloon may be introduced and complete dilatation of the cervix attained by making traction upon it, either by means of the hand or a weight hanging over the foot of the bed. It would appear, however, that this method is slightly more dangerous to the mother than bipolar version.

(d) In 34 cases accouchement forcé was undertaken for the sake of the child or the mother in patients who had already fallen into labor. The following indications were noted:

Hydramnios	1
Pyelonephrosis	1
Intense cystitis	1
Danger to the fetus, as indicated by sudden change in pulse rate or prolapse of cord	7
Very prolonged labor, as manifested by exhaustion and marked and persistent elevation in maternal pulse rate or fever	24

In this group of cases the cervical canal was intact in 4, the canal obliterated and external os partially dilated, but less than 5 cm. in diameter in 20, and the external os dilated to a greater extent than 5 cm. in 10 cases. All the mothers recovered, while 28 per cent of the children perished. But when it is remembered that nearly all the fetal deaths occurred in cases in which the life of the fetus was in great jeopardy at the beginning of the operation, the results may be considered as extremely satisfactory. Cervical tears were observed in 12 of the 34 cases, being described as deep in 7 and as slight in 5 cases, though in none of them was the hemorrhage profuse enough to require immediate repair.

It would appear, therefore, that after labor has set in spontaneously, except in cases of placenta prævia, accouchement forcé can be performed more safely than at other times, and may be undertaken with

comparative impunity whenever imperatively necessary. At the same time I do not wish to be understood as advocating its indiscriminate employment, as I believe it should be resorted to only when some serious danger threatens the life of the mother or child. Under such circumstances, however, I consider it a more conservative procedure than merely allowing nature to take her course; provided that the most rigorous aseptic technique is observed throughout the operation. It is in this class of cases, especially when the cervical canal is obliterated, and resistance is offered only by the external os, that Reynold's cervical dilator finds a considerable field for employment, although it is not used in any of the cases here cited.

Thus it is seen that in 87 cases of accouchement forcé we observed 3 deaths directly attributable to the operation. One of these occurred as the result of infection in an eclamptic woman with a very rigid cervix, while in the other two—one toxemia of pregnancy and the other placenta prævia—death was due to incomplete rupture of the uterus. Moreover, in addition to these 3 fatal cases, there were 7 others in which deep tears of the cervix required immediate operation for the control of the hemorrhage. Such results clearly show that the procedure is not absolutely harmless and is accompanied by a certain amount of danger, which, however, is not so great as to preclude its employment when necessary. At the same time, it is probable that the untoward result in several cases could have been avoided had the dilatation of the cervix been proceeded with more slowly, although it must be admitted that in other cases it was unavoidable.

In the employment of Harris' method it would appear, after a certain degree of dilatation has been secured, that the obstetrician experiences an almost uncontrollable desire to complete it as rapidly as possible. This tendency should be guarded against, for while in a certain number of cases it is possible to effect complete dilatation within five or six minutes, I am sure that much better results will be obtained by prolonging the procedure for a much longer period—thirty minutes not being excessive in the majority of cases.

If such serious results as those reported follow the employment of a method in which the amount of dilating force can readily be appreciated by the hand, what must one expect when a powerful metallic instrument, such as Bossi's dilator, is employed, in which the force is applied blindly to a system of compound levers by means of a screw or vise? At the same time I must confess that my objections to this

instrument are purely theoretical, but I nevertheless feel that my experience with Harris' method entitles me to speak with a certain amount of authority in the matter, and accordingly I can only endorse the recent warning of Zangemeister, who pointed out that powerful metallic dilators, while comparatively harmless in the hands of expert operators, may prove most dangerous when employed by the average practitioner.